

TWO NEW SPECIES OF *TRICHOTICHNUS* MORAWITZ FROM NORTH QUEENSLAND (COLEOPTERA: CARABIDAE: HARPALINAE)

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Two new species of *Trichotichnus* are described from north Queensland: *T. storeyi* sp. nov. and *T. tolgae* sp. nov. Also new records of *T. straneoi* (Louwerens) from north Queensland are communicated. A key is given to all known Australian *Trichotichnus*.

Zwei neue *Trichotichnus*-Arten aus Nordqueensland werden beschrieben: *T. storeyi* sp. nov. und *T. tolgae* sp. nov. Außerdem werden weitere Funde von *T. straneoi* (Louwerens) mitgeteilt. Für alle australischen *Trichotichnus*-Arten wird ein Bestimmungsschlüssel gegeben. □ Coleoptera, Carabidae, Harpalinae, *Trichotichnus*, new species, Queensland.

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*Trichotichnus* is a genus of Holarctic-Oriental ground beetles that are especially common in the eastern Palearctic Region but also rather numerous as far south as New Guinea (Darlington, 1968). Till recently this genus was unrecorded from Australia (Darlington, 1968; Noonan, 1985) but it has since been discovered in northeastern Queensland (Baehr, 1983, 1985) where a widespread Oriental and an endemic Australian species are now known.

In Australia, as well as in New Guinea, *Trichotichnus* are mainly collected at light traps. Single specimens have been found in rain forest litter, which is presumably the true habitat of most Indoaustralian *Trichotichnus*.

The two new species described in this paper were taken at light traps, together with three further specimens of *T. straneoi* (Louwerens). They were received courtesy of Mr R.I. Storey (Mareeba). They were collected at different localities on the Atherton Tableland and the Windsor Tableland between Mossman and Cooktown. These are areas of upland rainforest.

Neither of the new species match any of the described New Guinean or Australian forms. However, both are vaguely associated with different species-groups or subgenera of Noonan (1985).

Abbreviations for collections are CBM, Collection of M. Baehr, München; DPIM, Department of Primary Industries, Mareeba; and QMB, Queensland Museum, Brisbane. Measurements were made using an ocular micrometer. Length was measured from apex of labrum to apex of elytra. Hence measurements can slightly differ

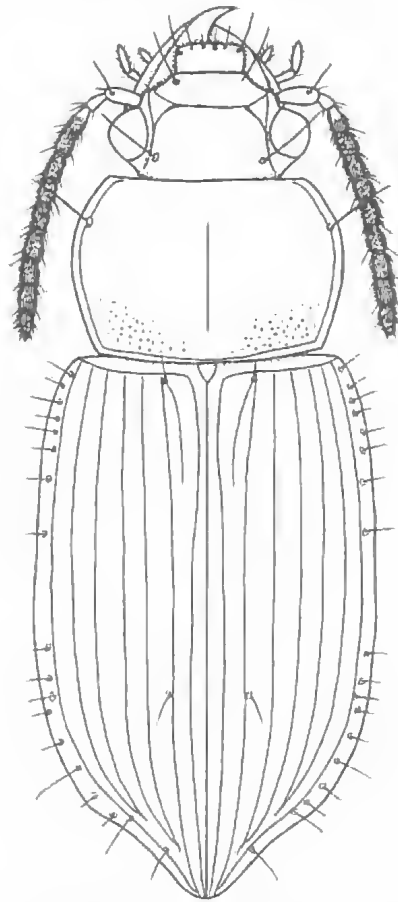


FIG. 1. *Trichotichnus storeyi* sp. nov., holotype. Scale: 5mm.

from those of other authors, especially Darlington (1968).

***Trichotichnus straneoi* (Louwerens)  
(Fig.8)**

*Carbanus straneoi* Louwerens, 1962, p. 142, fig. 7.  
*Trichotichnus straneoi* Darlington 1968, p. 50;  
Noonan 1985, p. 67; Baehr 1985, p. 21.

**MATERIAL EXAMINED**

NEW RECORDS: 1♂, Windsor Tableland, Qld, 29-30.XII.1984, at light, R.I. Storey (DPIM); 1♀, Tolga, Qld, 22.VIII.1986, light trap, J.D. Brown (CBM); 1♀, Tully Falls, SF 730m, 18km SSW Ravenshoe, Qld, 18.I.1988, light. Storey and Dickinson (DPIM).

**REMARKS**

This species was recently included in the subgenus *Trichotichnus s. str.* by Noonan (1985). It is known from Amboina, New Guinea, New Britain, and New Ireland (Darlington, 1968) and was recently recorded from north Queensland (Baehr, 1985). The new records indicate that this species is rather widely distributed and common in the tablelands of northeastern Queensland. It lives in leaf litter in rainforest (Baehr, 1985). However, the best collecting method seems to be lighting; all three of the records are from light traps.

***Trichotichnus storeyi* sp. nov.  
(Figs 1,3,5,7,8)**

**MATERIAL EXAMINED**

HOLOTYPE: ♂, Australia, NQ, Tully Falls SF 730m, 18km SSW Ravenshoe, 18.I.1988, light, Storey and Dickinson (QMB T.11327).

PARATYPES: 1♂, 1♀, same data, ♀ labelled: *Trichotichnus demarzi* Baehr, det. R.I. Storey 1988 (DPIM, CBM).

**TYPE LOCALITY**

Tully Falls, Atherton Tableland, NQ.

**DIAGNOSIS**

Easily recognised by yellow border of pronotum, clytra, and abdomen and by wide posterior angles of pronotum.

**DESCRIPTION**

*Measurements:* Length: 7.9-8.2mm, width: 3.3-3.4mm. Width of head/pronotum: 0.78-0.8. Width/length of pronotum: 1.49-1.53. Width of base/apex of pronotum: 1.18-1.2. Width of

pronotum/clytra: 0.76-0.78. Length/width of elytra: 1.55-1.58.

*Colour:* Black with slight metallic lustre. Lateral border of pronotum narrowly yellow. Two outer intervals of clytra yellow, this yellow border widened at apex almost to suture. Lower surface black, lateral parts of thorax brown with scattered yellow spots, abdominal segments with a lateral and a sublateral yellow spot each, brown between, apex of last segment yellow. Labrum brownish, antennae dark yellow, with 2nd and 3rd segments piceous and terminal segments becoming gradually lighter. Each segment with a distinct dark median stripe on inner and outer

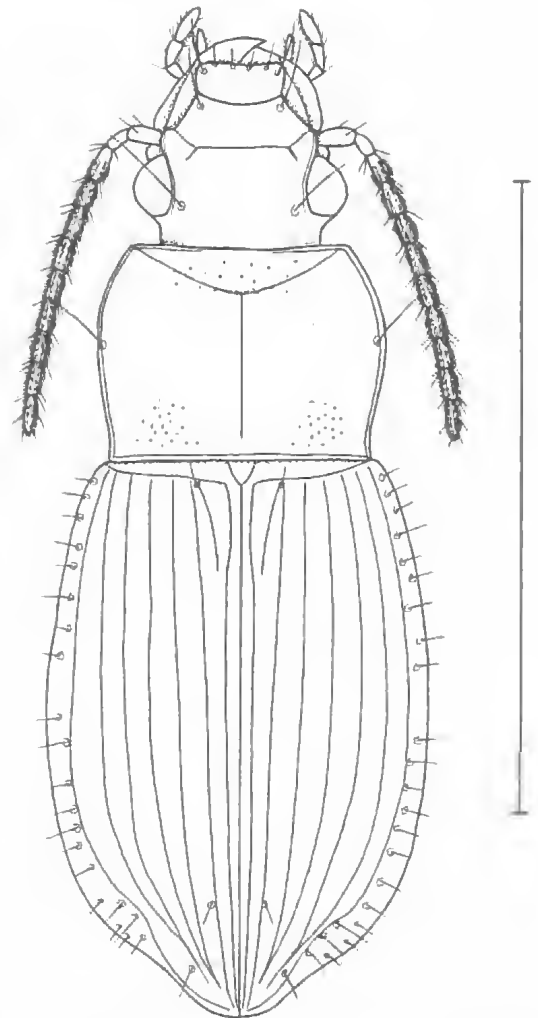
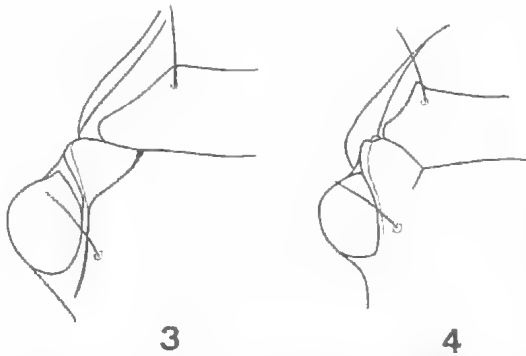


FIG. 2. *Trichotichnus tolgae* sp. nov., holotype. Scale: 5mm.



FIGS 3,4. Clypeo-ocular sulcus. 3. *Trichotichnus storeyi* sp. nov.; 4. *Trichotichnus tolgae* sp. nov.

surface. Palpi lighter brown. Femora yellow, tibia yellow at base, infuscate to apex, considerably darker than femora. Tarsi infuscate.

**Head:** Large, with large, rather protruding eyes. Orbits short. Eyes separated from mouth by *c.* 1/6 of eye diameter. Clypeal suture deep. Clypeo-orbital sulcus distinct, elongate, almost attaining eye, though not prolonged inside eye. Clypeus with one seta each, labrum 6-setose. Antennae short, barely surpassing base of pronotum. Median segments wide, square, almost as wide as long. 3rd segment pilose from middle. Last and fore-last segments of palpi finely setose. Labium with elongate, unidentate tooth. Microsculpture of upper surface inconspicuous.

**Pronotum:** Considerably wider than head, *c.* 1.5 times wide as long, widest shortly behind position of lateral seta. Apex very lightly excised, anterior angles rounded off, not projecting. Lateral borders anteriorly convex, behind middle almost straight. Posterior angles wide, obtuse, base laterally rather oblique. Base distinctly bordered laterally, medially smooth. Median line well impressed, neither attaining apex nor base. Basal grooves shallow, slightly linear. Base laterally punctate, rather smooth in middle. Microsculpture indistinct, rather irregular.

**Elytra:** Rather parallel, short, lateral borders well sinuate in front of apex. Shoulder rounded off. Striae fine, impunctate, intervals slightly convex, especially near apex. Setiferous puncture adjacent to 2nd stria, approximately at posterior 2/3 of elytra. Microsculpture of intervals consisting of very indistinct transverse lines. Intervals also with fine punctures, rather glossy, winged.

**Lower surface:** Prosternum, metasternum, and

base of abdomen with fine, rather dense pilosity. Pilosity on 4th-6th abdominal sternites extremely short and fine, difficult to see. Lower surface shagreened. Last abdominal sternite laterally slightly excised. ♂ and ♀ with 4 setae at apex of last sternite.

**Legs:** Anterior tibia not much widened at apex. ♂ anterior and median tarsi biserially squamose beneath. 1st segment of metatarsus rather short, considerably shorter than 2nd and 3rd segments together.

**Male genitalia:** Aedeagus elongate, narrow, basally strongly curved. Apex with minute up-turned denticle. Internal sac and parameres see Fig. 7.

**Variation:** There is little variation among the few specimens available.

#### DISTRIBUTION

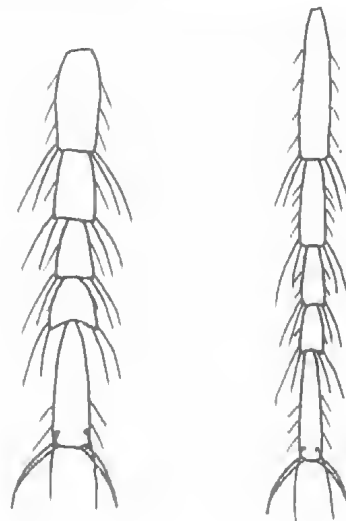
Known only from type locality in southern Atherton Tableland, NEQ.

#### HABITAT

Not known, but perhaps lives in rainforest litter. This is apparently an upland rainforest species.

#### RELATIONSHIPS

It is difficult to assign *T. storeyi* to any of the currently distinguished subgenera of Noonan (1985), because it is somewhat intermediate be-



FIGS 5,6. Posterior tarsus. 5. *Trichotichnus storeyi* sp. nov.; 6. *Trichotichnus tolgae* sp. nov.

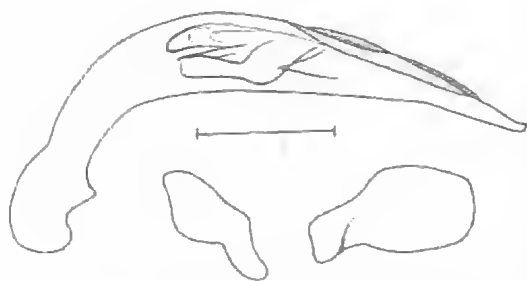


FIG. 7. ♂ genitalia of *Trichotichnus storeyi* sp. nov.  
Scale: 0.5mm.

tween *Trichotichnus s. str.* and *Harpaloxenus* Schauberg. It has the apex of anterior tibia not conspicuously widened, but has at the same time the lower surface of the thorax and abdomen strongly mottled, which is only ascribed to members of subgenus *Harpaloxenus* (Noonan, 1985). From descriptions, *T. storeyi* seems next to *T. brandti* Darlington and *T. obscurus* Darlington, respectively, both from New Guinea. However, it is slightly smaller than both species and is further distinguished by slightly wider pronotum with lateral borders not at all sinuose, and by wide, conspicuous, yellow, lateral border of elytra.

*Trichotichnus tolgae* sp. nov.  
(Figs 2,4,6,8)

MATERIAL EXAMINED

HOLOTYPE: ♀, Australia, NQ, Tolga, 3.XI.1985, J.D. Brown, light trap (OMB T.11326).

TYPE LOCALITY

Tolga, 5km N Atherton, Atherton Tableland, NEQ.

DIAGNOSIS

Distinguished by lack of dorsal and ventral pattern and by convex pronotum with short, but accentuate prebasal sinuosity.

DESCRIPTION

*Measurements:* Length: c.7.5mm, width: c.3.2mm. Width of head/pronotum: 0.7. Width/length of pronotum: 1.39. Width of base/apex of pronotum: 1.27. Width of pronotum/elytra: 0.76. Length/width of elytra: c.1.45.

*Colour:* Piceous, rather glossy. 1st antennal segment dark yellow, following segments slightly darker, terminal segments yellow again.

Median segments with inconspicuous dark stripe on inner and outer surface. Palpi dirty yellow. Legs reddish, apex of tibia and tarsi slightly darker. Ventral surface piceous.

*Head:* Almost as wide as apex of pronotum. Eyes large, protruding. Orbits distinct, oblique. Eyes separated from mouth by c.1/5 of diameter of eye. Clypeal suture deep. Clypeo-orbital sulcus deep, rather short, almost punctiform, not attaining eye, not prolonged inside median border of eye. Clypeus with one seta each, labrum 6-setose. Antennae medium-sized, attaining base of pronotum. Median segments almost twice as long as wide. 3rd segment pilose from middle. Last and fore-last segments of palpi sparsely setose. Labium with a short, triangular tooth. Microsculpture of upper surface fine, though distinct, consisting of rather regular, slightly transverse meshes.

*Pronotum:* Convex, rather narrow, with wide base. Apex straight, but anterior angles slightly produced. Lateral borders convex throughout, though with a short, distinct sinuation just in front of the rectangular posterior angles. Base almost straight. Pronotum widest at position of lateral setae, slightly in front of middle. Median line superficial, neither reaching apex nor base. Base strongly bordered, also in middle. Basal grooves shallow, circular. Base with very scattered punctures, laterally of basal grooves rather smooth. Medially behind apex also with some punctures. Surface glossy, but with fine, regular, slightly transverse microsculpture.

*Elytra:* Rather short and wide, slightly widened behind middle. Shoulders rounded. Lateral borders well sinuate in front of apex. Striae smooth, quite deep. Intervals convex throughout, near apex strongly convex. Setiferous puncture in middle of 3rd interval, though nearer to 2nd stria, far down on apical declivity, at approximately last 1/6 of elytra. Microsculpture distinct, composed of slightly transverse, regular meshes. No additional punctures visible. Winged.

*Lower surface:* Prosternum, metasternum, and basal abdominal segment medially with short pubescence. Other abdominal segments virtually smooth. Lower surface finely microreticulate. Last abdominal sternite laterally not excised, in ♀ 4-setose.

*Legs:* Anterior tibia not widened at apex. Clothure of anterior and median tarsi of ♂ unknown. 1st segment of metatarsus elongate, approximately as long as 2nd and 3rd segments together.

*Male genitalia*: Unknown.

#### DISTRIBUTION

Known only from type locality in Atherton Tableland, NEQ.

#### HABITAT

Unknown. The type was collected at light. It probably lives in rainforest litter.

#### RELATIONSHIPS

Unknown. *T. tolga* belongs to subgenus *Trichotichnus* s. str., though it is a rather atypical species. There is no obvious relationship to

anyone of the New Guinean species included in Darlington's (1968) key. Using this key, *T. tolga* comes to *T. medius* Darlington which is, however, not closely related to *T. tolga*. As long as the ♂ genitalia and tarsal vestiture is unknown, the relationships will be obscure.

#### DISCUSSION

With the two species described here, four *Trichotichnus* species are now known to occur in northeastern Queensland, all in or near the uplands of Atherton Tableland and Windsor Tableland. All species seem to live in leaf litter of mountain rainforest (Baehr, 1983, 1985) which is the same mode of life that several of the New Guinean species apparently have (Darlington, 1968). The four Australian species belong to different species groups and they are perhaps more closely related to certain New Guinean species than one to another. As was to be expected from the high species diversity in New Guinea, northeastern Australia also has quite a diverse *Trichotichnus* fauna. Certainly the four species are outliers of the northern, Oriental fauna from which many members have dispersed to northern Queensland, mainly via New Guinea and Cape York Peninsula (Darlington, 1961, 1971; Kikkawa, Monteith and Ingram 1981). This means that north Queensland was subject to several independent invasions of different *Trichotichnus* stocks, the most recent apparently being that of *T. straneoi* which has conspecific populations in Australia, New Guinea and much of Melanesia. It is to be expected that future collecting in the upland rainforests of northern Queensland will result in the discovery of yet more *Trichotichnus*.

#### KEY TO THE AUSTRALIAN SPECIES OF *TRICHOTICHNUS*

1. Prothorax wide with strongly convex sides, head only 2/3 as wide as prothorax. Surface of elytra strongly iridescent. Small species, less than 6.5mm long ..... *T. straneoi* (Louwerens)

Prothorax less wide, sides posteriorly rather straight or even sinuate, head almost 3/4 as wide as prothorax. Elytra not or only slightly iridescent. Larger species, always over 7mm long.. 2

2. Pronotum and elytra distinctly bordered with yellow. Abdomen with lateral yellow border and sublateral yellow spots. Sides of pronotum near

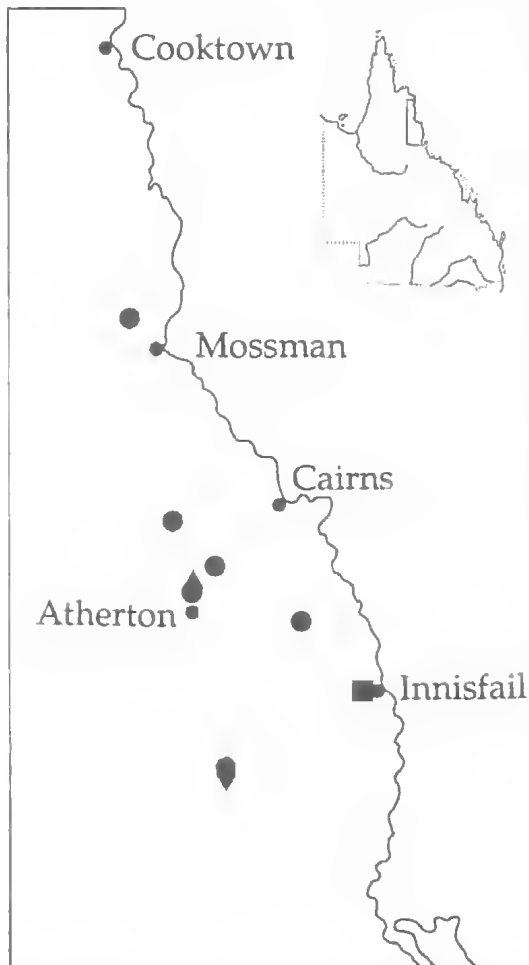


FIG. 8. Distribution of the Australian *Trichotichnus*-species: ● *Trichotichnus straneoi* (Louwerens); ■ *Trichotichnus demarzi* Baehr; ▼ *Trichotichnus storeyi* sp. nov.; ▲ *Trichotichnus tolga* sp. nov.

base convex, posterior angles wide, because lateral parts of base clearly oblique ..... *T. storeyi* sp. nov.

Pronotum at most inconspicuously bordered with yellow. Abdomen with lateral yellow border or spots or not, but without sublateral spots. Sides of pronotum posteriorly straight or even slightly concave. Posterior angles less wide, base straight ..... 3

3. Larger species, 9mm long or longer. Clypeo-ocular sulcus prolonged as a furrow inside eyes. Abdominal segments with large, yellow, lateral spots. Femora conspicuously lighter than tibiae. Pronotum heart-shaped, widest well in front of middle, sides near base straight ..... *T. demarzi* Baehr

Smaller species. c.7.5mm long. Clypeo-ocular sulcus not prolonged inside eye. Abdomen without yellow spots. Femora not conspicuously lighter than tibiae. Pronotum widest approximately at middle, sides posteriorly convex, but shortly sinuate just in front of posterior angles ..... *T. tolgae* sp. nov.

#### ACKNOWLEDGEMENTS

I want to express my thanks to Mr R.I. Storey (DPIM, Mareeba) who kindly offered the specimens for examination.

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